REMARKS

Applicants have filed the present application as a continuation of US Patent Application Serial No. 10/225,008. Claims 1-10 and 22-29 have been cancelled, and claims 11-21 remain pending herein, claim 11 being the sole independent claim.

RESPONSE TO REJECTIONS UNDER 35 USC § 103

In the parent application to this case, claims 11-21 were rejected under 35 USC 103 in view of US Patent No. 5,531,117, to Fortes, in the Office Action mailed by the Patent Office on August 27, 2003. Applicants respond in substance to the rejection of those claims as follows.

In the rejection of claims 11-21 in the parent to this case, the Examiner stated with respect to claims 11-21 that the '117 patent teaches in Fig.1, an ultrasound imaging system with means for identifying impulse response, means for selecting desired receive channel filter function, means for formulating a receive channel filter responsive to the desired filter function and the receive channel impulse response (col. 11, lines 29-36). The Examiner further stated that the specific limitation of processing harmonic echos of ultrasound energy transmitted is obvious because it is well known to process harmonics in order to exclude the fundamental components for better image resolution.

Applicants respectfully disagree. Applicant inventions, as claimed, are not an attempt by applicants to receive broad rights to improving image resolution in harmonic imaging by doing away with fundamental frequency components from received signals.

Applicant' claim 11 is directed to an ultrasound-imaging system with means for identifying the impulse response of a receive channel of the ultrasound-imaging system; means for selecting a desired receive channel filter function, wherein the receive

channel processes a harmonic echo of ultrasound energy transmitted by the ultrasound-imaging system; and means for formulating a receive channel filter responsive to the desired filter function and the receive channel impulse response.

The Fortes patent teaches, at col. 11, lines 29-36, a sampled aperture imaging system with means for selectively operating transducers in a reception mode to produce analog detection signals in receive channels in response to detected reflected ultrasound energy, where each receive channel corresponds to a transducer. The invention includes means for sampling and demodulating the analog signals into a complex digital signal, and a plurality of phase locked loops for estimating maximum likelihood of phase aberration angles associated with the complex digital signals and the receive channels. The first loop is a 2-D loop, including phase first rotating means, is for correcting phase of the digital complex signal samples of the first receive channel by an amount equal to a first phase aberration angle, and a second phase rotating means for correcting the phase of digital complex signal samples of the second receive channel. The first 2D loop estimating first and second phase aberration angles for first and second receive signals, and the second phase rotating means is for correcting phase of the digital complex signal samples of the second receive channel by an amount equal to the second phase aberration angle. The first 2-D phase locked loop includes a first whitening filter for filtering the digital complex signal samples of the first receive channel, with an output coupled to an input of the first phase rotating means and having an impulse response selected to perform deconvolution of a first time correlation.

In its Summary of the Invention, the Fortes patent states that the purpose of the invention was to correct for phase aberration by estimating directly from measured data, and that correction phase

rotations are calculated for each transducer element using acquired beam data.

Applicants' inventions are readily distinguishable from Fortes, and one skilled in the art would not understand that Fortes suggests or teaches applicants' inventions as claimed. Fortes teaches phase correction for each element, with at least one phase locked loop including a lightening filter coupled to the input of the phase rotating means. More particularly, Fortes does not teach or suggest an ultrasound-imaging system with means for identifying the impulse response of a receive channel of the ultrasound-imaging system, means for selecting a desired receive channel filter function, wherein the receive channel processes a harmonic echo of ultrasound energy transmitted by the ultrasound-imaging system and means for formulating a receive channel filter responsive to the desired filter function and the receive channel impulse response.

Accordingly, applicants respectfully assert that independent claim 11, and claims 12-21 which depend therefrom, are not obvious over Fortes, and request the withdrawal of the rejection of claims 11-21 under 35 USC 103.

In view of this amendment, Applicants believe that this application is now in condition for allowance, urge the passage to issue of the application, and request that the Examiner call their counsel of record at anytime to further those ends.

Respectfully submitted,

By: _____

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